WHAT IS CLAIMED IS:

1. A wing-drive mechanism for a vehicle having a fuselage, comprising

a) an outwardly extending spar that is moveable independently in flap, yaw and pitch directions about a pivot point;

b) an inwardly extending spar that is moveable independently in flap, yaw and pitch directions about the pivot point,

c) a drive wing mounted on the outwardly extending spar;

d) a first axis drive mechanism for moving said drive wing about the pivot point in a flap direction in response to a first movement input signal, said first drive mechanism including a first arcuate guide rail which moves in response to said first movement input signal and a first sleeve slidably mounted on said first arcuate guide rail;

e) a second axis drive mechanism for moving said drive wing about the pivot point in a yaw direction in response to a second movement input signal, said second drive mechanism including a second arcuate guide rail which moves in response to said second movement imput signal, a second sleeve slidably mounted on said second arcuate guide rail and wherein said second axis drive mechanism operates independently of said first axis drive mechanism; and

f) a third axis drive mechanism for adjusting the pitch of said drive wing in response to a third movement input signal, wherein said third axis drive mechanism operates independently of said first and second axis drive mechanisms,

wherein said inwardly extending spar is connected directly or indirectly to said second sleeve and said first sleeve is connected to said second sleeve, such that movement of said first axis drive mechanism is transferred to the outwardly extending spar through movement of said first sleeve, second sleeve and inwardly extending spar, and movement of said second axis drive mechanism is transferred to the outwardly extending spar through movement of said second sleeve and said inwardly extending spar.

2. The wing-drive mechanism of claim 1 wherein said wing-drive mechanism further comprises a controller that generates said first, second and third movement input signals by calculating said first, second and third movement input signals in real time using a controlling function that relates a desired drive wing trajectory and an actual drive wing trajectory to torques to be applied by each of said first, second and third axis drive mechanisms.

3. The wing-drive mechanism of claim 2, wherein said controller specifies said desired drive wing trajectory and said actual drive wing trajectory as drive wing orientation parameters, drive wing rate of change orientation parameters, drive wing rate of change of rate of change of orientation parameters, or a combination of two or more of these.

4. The wing-drive mechanism of claim 3, wherein said wing-drive mechanism further comprises an automated trajectory specification system that specifies the desired drive wing trajectory and said actual drive wing trajectory to the controller.

5. The wing-drive mechanism of claim 4, wherein said desired drive-wing trajectory and said actual drive wing trajectory are specified to the controller as one or more values representing the difference between said desired drive-wing trajectory and said actual drive wing trajectory.

6. The wing-drive mechanism of claim 5, wherein said automated trajectory specification system generates said desired drive wing trajectory by comparing inputted actual and desired data that is selected from the group consisting of vehicle position, velocity, acceleration, orientation, rate of change of orientation, rate of change of rate of change of orientation and combinations of two or more thereof.

7. The wing-drive mechanism of claim 6 wherein said automated trajectory specification system includes a fuzzy logic processor or a neural network.